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CORTINARIUS CYANITES IN THE UNITED STATES.[1]

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(*Plates 151, 152.*)

ON July 16, 1906, the writer was walking with some friends in a forest near Chocorua, New Hampshire. While discussing the colors of fungi, one of the party remarked, "I have never seen a blue mushroom." These words were scarcely uttered, when, much to our delight, a specimen of that hue was espied. It proved to be one of the rarest as well as one of the most beautiful of Cortinarii.

A colored sketch was prepared without delay (Pl. 151), and the following notes made.

"Cortinarius species. Single, young specimen. Chocorua, N. H. Among dead leaves. July 16, 1906. Grew on the left of the path that leads from the Chocorua River rustic bridge to Hayford's farm.

"Pileus (before expansion) 6 cm., convex, pale grayish-blue, smooth, appressedly and radiately fibrillose, the center inclining to a light, livid brown; the margin incurved and exceeding the gills, finely fibrillose, the fibrils interlaced and of a light cinnamon-brown (spores deposited?).

"Gills concolorous, but of a deeper shade of blue, quite close; edges very pale, crenulate.

"Stem 14 cm. long, 2.2 cm. thick at the apex, gradually enlarged downwards; basal bulb 5.5 cm. thick, tapering to a dull point. Exterior of stem concolorous, except at base which is reddish violaceous; all but the base covered with fibrils that are gathered together to form little, transverse, wave-like fascicles; apex not so rough; base smooth.

[1] Contribution from The Howard A. Kelly Mycological Library, Baltimore, Md.

"Coloring of interior. Flesh whitish at first, changing speedily to blood-red, finally to a dirty tint. The red color is especially noticeable in the base, from which a red juice can be pressed. Under the cortex of the median portion of the stem the blue is retained."

The spores were not measured, but their shape is shown in the plate. From the drawing it is also evident that they were uni- to tri-guttulate. Their color, as seen by transmitted light under the microscope, was a light yellow-brown. The epispore was smooth, not verrucose. The specimen was not kept, but the colored plate, from which the present reproduction was made, is preserved in the Howard A. Kelly Mycological Library.

With the aid of these notes, and the plate, the plant was identified as *Cortinarius cyanites* Fr. There are, however, several explainable discrepancies. Fries (5 and 6) says that the stem is smooth (laevigatus). His figure (7) represents a fully developed plant. The stem is without adornment, except in the lower, basal portion where a dense covering of light-blue fibrils appears in the contour of the figure that gives a general view. Gillet's plate (8), on the other hand, might have been drawn from our specimen, so close is the resemblance. The stem shows the peculiar, transverse fiber-fascicles. Further, the spores, according to Ricken (12), should be verrucose, yet, bearing in mind what Kauffman (9) says of Cortinarius spores in general ("when young the epispore is smooth"), it is clear that the plant was too immature to have developed this common Cortinarius character.

Secretan's description (13), under *Agaricus cyanus* Pers., apparently the first ever published, covers our plant, with unimportant differences. Berkeley and Broome (2) speak of it as a "magnificent species," and as "one of the finest of the genus." Rea (11) says the stem is fibrillose. Bataille's plant (1) is ours. Quélet (10) regards it as a luxuriant variety of *C. alboviolaceus*.

Having determined the plant to our satisfaction, it was discovered that *C. cyanites* is mentioned but once in American mycological literature, so far as we could learn. In 1903, my esteemed colleague, Miss Jennie F. Conant, secretary of the Boston Mycological Clue, published the name in a list of fungi exhibited at Horticultural Hall, Boston, during the summer and autumn of 1902 (3). Miss Conant has since informed the writer that the Club's herbarium contains four specimens of the species, only one of which is mature. They

were collected at Alstead, N. H., July 25, 1902, by my friend, Mr. Hollis Webster, who states (in litt.): "I cannot remember whether Dr. Farlow had a specimen. The determination was mine originally, but probably he confirmed it." The late Mr. George B. Fessenden, whose name appears on the herbarium label, and who, for many years, was president of the Boston Mycological Club, merely communicated the plants to one of that year's exhibitions.

The Club's herbarium also preserves a lantern-slide from a negative made by Mr. Webster, showing three of the specimens in the fresh state. The figures (Pl. 152), made from this slide, demonstrate that the Alstead and Chocorua plants are unquestionably identical as to external structure. The figure of the fully developed plant, on the extreme left of our plate, shows that the roughness on the stems of young specimens disappears with age.

Through the kindness of Miss Conant, the writer was permitted to examine a fragment of a gill from this mature specimen. Under a one-twelfth, oil-immersion objective, the spores were seen to vary as to roughness, younger ones showing a smooth epispore, while fully matured ones were tuberculate. Some, of intermediate size, were part rough and part smooth. Frequently the roughness would appear as a granulation within, while the contour, in optical section, was perfectly smooth. They measured 5.5–6.6 × 10 μ. Cooke's measurements (4) are 5–6 × 10 μ.

On the basis of the above facts, it is safe to claim this extremely rare and exceptionally beautiful Cortinarius as a United States species.

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Explanation of Plates

Pl. 151. *Cortinarius cyanites* Fr. from Chocorua, N. H. Reproduced from a photograph of the writer's painting of the actual specimen.
Fig. 1. Young plant, Fig. 2. Section of the same. Fig. 3. The spores.
Pl. 152. *Cortinarius cyanites* Fr. from Alstead, N. H. Reproduced from a photograph made from a lantern-slide.
Fig. 1. Mature specimen. Fig. 2 and 3. Younger specimens.

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THE AMPHIBIOUS GROUP OF POLYGONUM, SUBGENUS PERSICARIA.

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(*Continued from page 152.*)

KEY TO THE AMPHIBIOUS PERSICARIAS OF EUROPE AND AMERICA.

Plants perennial, more or less amphibious: flowers dimorphous as to stamens; these members accordingly strongly exserted or much reduced and included; the two types usually segregated on different plants; long-stamened flowers almost invariably sterile and the short-stamened frequently so.

a. Aquatic forms; stems floating or somewhat emersed: leaves glabrous (becoming more or less hirsute in transition-forms), elliptic or oval *b.*
  b. Margins of leaves armed with short harsh bristles
    1a. *P. amphibium* f. *natans.*
  b. Margins naked or with weak hairs or bristles *c.*
    c. Peduncle glabrous: panicle ovoid, 1–5 cm. long
      Panicle 1–3 cm. long: fruiting calyx not over 6 mm. long ..... 2a. *P. natans* f. *genuinum.*
      Panicle 4–5 cm. long: fruiting calyx 6–7 mm. long
        2c. *P. natans* var. *insigne.*
    c. Peduncle hairy: panicle cylindric, 3–10 cm. long
      Leaves mostly cordate: internodes not inflated nor tapering upward ..... 3b. *P. coccineum* f. *natans.*
      Leaves mostly rounded or acutish at the base: internodes inflated or tapering upward . . 3c. *P. coccineum* var. *rigidulum.*